

Permittee: Air Products & Chemicals, Inc.
Facility: Massena Green Hydrogen Facility
SPDES Number: NY0270342
USEPA Non-Major/Class 01 Industrial

Date: October 30, 2023 v.1.18
Permit Writer: Peter Maier
Water Quality Reviewer: Evan Walters
Full Technical Review

SPDES Permit Fact Sheet

Air Products & Chemicals, Inc.

Massena Green Hydrogen Facility

NY0270342



Contents

Summary of Permit Changes	3
Administrative History	3
Facility Information.....	3
Site Overview	4
Enforcement History	4
Existing Effluent Quality.....	4
Interstate Water Pollution Control Agencies	4
Receiving Water Information.....	4
Impaired Waterbody Information	5
Critical Receiving Water Data & Mixing Zone	5
Permit Requirements	6
USEPA Effluent Limitation Guidelines (ELGs) Applicable to Facility	6
Antidegradation	6
Discharge Notification Act Requirements.....	6
Best Management Practices (BMPs) for Industrial Facilities	6
Stormwater Pollution Prevention Requirements	6
Mercury	6
Emerging Contaminant Monitoring	7
Schedule(s) of Additional Submittals	7
Special Conditions.....	7
OUTFALL AND RECEIVING WATER SUMMARY TABLE.....	8
POLLUTANT SUMMARY TABLE - Outfall 001	8
Appendix: Regulatory and Technical Basis of Permit Authorizations.....	13
Regulatory References.....	13
Outfall and Receiving Water Information	13
Interstate Water Pollution Control Agencies	14
Existing Effluent Quality.....	14
Permit Requirements.....	14

Summary of Permit Changes

A new State Pollutant Discharge Elimination System (SPDES) permit has been drafted for the Massena Green Hydrogen Facility. The permit requirements are summarized below:

- Effluent limits for:
 - pH
 - Total suspended solids
 - Mercury
- Effluent monitoring requirements for:
 - Flow rate
 - Temperature
 - Emerging contaminants (short-term monitoring)
 - Priority pollutant sampling (one-time requirement)
- Discharge Notification Act Requirements
- Development of a Best Management Practices plan
- A requirement to submittal design documentation and certify the construction of the new wastewater treatment facility

This fact sheet summarizes the information used to determine the effluent limitations (limits) and other conditions contained in the permit. General background information including the regulatory basis for the effluent limitations and other conditions are in the [Appendix](#) linked throughout this fact sheet.

Administrative History

4/6/2023 The Air Products & Chemicals, Inc. submitted a NY-2C permit application, supplemental information, and a Preliminary Engineering Report.

As part of this application submission and pursuant to the requirements of Section 7(2) and Section 7(3) of the Climate Leadership and Community Protection Act (CLCPA), the Department has requested and received information regarding the project's consistency with the CLCPA.

The Notice of Complete Application, published in the [Environmental Notice Bulletin](#) and newspapers, contains information on the public notice process.

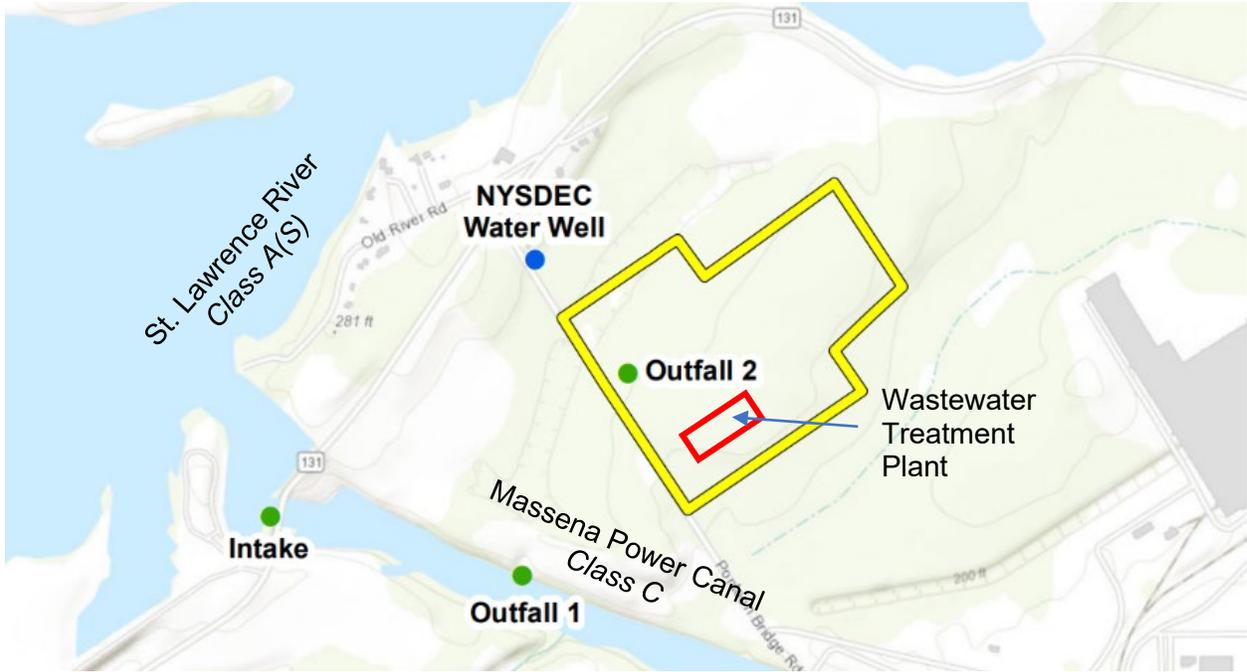
Facility Information

This is an industrial facility (SIC code 2813 – industrial gas manufacturing) that produces hydrogen gas by electrolysis. This facility is a categorical industry as defined in 40 CFR Subchapter N and certain requirements apply per this categorization (see [Effluent Limitation Guidelines](#)). Raw water is purchased from the Village of Massena and treated on-site before being used for hydrogen production. Effluent from Outfall 001 will consist of water (influent) treatment backwash, raw water reject, oily sump wastewater (from truck loading operations), cooling water blowdown, steam condensate, and compressor condensate. Outfall 001 has a design flow of 0.74 MGD and will discharge to the Massena Power Canal, Class C. Effluent from Outfall 002 will consist of treated sanitary wastewater (750 GPD septic system) discharging to groundwater. No effluent monitoring or limitations are proposed for Outfall 002, but this may be subject to modification if future design documentation submitted to DEC indicates the need to monitor or limit parameters.

The proposed wastewater facility is expected to be operational in 2026 and the wastewater treatment system will be designed to meet all effluent limitations presented in this fact sheet. Construction on the new wastewater treatment facilities cannot occur until the design documentation is approved by DEC. If the

approved treatment system significantly alters the expected waste stream, the issued permit may require modification before the permittee can begin discharging.

Site Overview



Enforcement History

Compliance and enforcement information will be available on the EPA’s [Enforcement and Compliance History Online \(ECHO\)](#) website.

Existing Effluent Quality

The [Pollutant Summary Table](#) presents the *projected* effluent quality and effluent limitations. The projected effluent quality was determined from the application and corresponding Preliminary Engineering Report submitted by the permittee on 4/6/2023. [Appendix Link](#)

Interstate Water Pollution Control Agencies

Outfalls 001 and 002 are located within the Great Lakes watershed and International Joint Commission (IJC) compact area. [Appendix Link](#)

Receiving Water Information

The facility proposes to discharge via the following outfalls:

Outfall No.	SIC Code	Wastewater Type	Receiving Water
001	2813	Water treatment backwash, oily sump wastewater, cooling water blowdown, steam condensate, compressor condensate	Massena Power Canal, Class C
002	N/A	Treated Sanitary	Groundwater, Class GA

Reach Description: Outfall 001 discharges to the Massena Power Canal (Class C). The Grass River (Class B) is approximately 2.5 miles downstream of Outfall 001. The St. Lawrence River (Class A(S)) is approximately 9.5 miles downstream of Outfall 001.



The map above shows the approximate location of Outfall 001 relative to ambient RIBS stations and the general path of the effluent down to the St. Lawrence River. No RIBS stations are located along the Massena Canal and ambient pH and hardness values were calculated from data collected at a nearby facility. RIBS station 09-STLW-8.3, in the St. Lawrence River near the confluence with the Grass River, was used to establish ambient background concentrations.

See the [Outfall and Receiving Water Summary Table](#) and [Appendix](#) for additional information.

Impaired Waterbody Information

The Massena Power Canal, Grass River, and St. Lawrence River [portion 1] (PWL No. 0904-0014, 0904-0904, and 0901-0001, respectively) were listed on the 2020 [New York State Section 303\(d\) List](#) of Impaired/TMDL Waters due to polychlorinated biphenyls (PCBs) from contaminated sediment. Additionally, the St. Lawrence River is contaminated for dioxins and Mirex from contaminated sediment. TMDLs to address these impairments have not yet been developed and the proposed facility is not expected to discharge PCBs, dioxin, or Mirex.

Critical Receiving Water Data & Mixing Zone

The proposed Outfall 001 consists of a bankside discharge that flows over riprap to the Massena Power Canal, a vertical distance of about 10.5 feet. From this configuration, it is expected the effluent will have low velocity entering the Canal and achieve little mixing with the background flow. As such, the near-field dilution has been limited to 2:1 for acute and chronic dilution ratios. A CORMIX model was also developed, and while the input criteria were estimated/assumed, the model supports using a dilution of 2:1. The HEW dilution ratio was calculated after complete mixing with the receiving waterbody.

Outfall No.	Acute Dilution Ratio A(A)	Chronic Dilution Ratio A(C)	Human, Aesthetic, Wildlife Dilution Ratio (HEW)	Basis
001	2:1	2:1	4:1	TOGS 1.3.1

Critical receiving water data are listed in the [Pollutant Summary Table](#) at the end of this fact sheet. [Appendix Link](#)

Permit Requirements

The technology based effluent limitations ([TBELs](#)), water quality-based effluent limitations ([WQBELs](#)), [Existing Effluent Quality](#) and a discussion of the selected effluent limitation for each pollutant present in the discharge are provided in the [Pollutant Summary Table](#).

USEPA Effluent Limitation Guidelines (ELGs) Applicable to Facility

Best Practicable Control Technology Currently Available (BPT), Best Conventional Pollutant Control Technology (BCT), Best Available Technology Economically Achievable (BAT), and New Source Performance Standards (NSPS) limitations are based on Effluent Limitation Guidelines developed by USEPA for specific industries¹.

For the applicable categorical limitations under 40 CFR Part 415, Subpart AO, the following requirement was evaluated during this permit development process:

"There shall be no discharge of [process wastewater pollutants](#) to [navigable waters](#), except as provided for [in part 419](#) of this chapter ([39 FR 16560](#))."

The Massena Power Canal is "closed to navigation" per the U.S. Coast Pilot (NOAA, [CPB6 C04 WEB.pdf](#) ([noaa.gov](#)), 2023), although it is still a "water of the United States" as defined in CWA Section 502. As such, the proposed discharge is applicable to and in conformance of the 40 CFR Part 415, Subpart AO.

Antidegradation

The permit contains effluent limitations which ensure that the best usages of the receiving waters will be maintained. The Notice of Complete Application published in the Environmental Notice Bulletin contains information on the State Environmental Quality Review (SEQR)² determination. [Appendix Link](#)

Discharge Notification Act Requirements

In accordance with the Discharge Notification Act (ECL 17-0815-a), the permittee is required to post a sign at each point of wastewater discharge to surface waters, unless a waiver is obtained.

Additionally, the permit contains a requirement to make the DMR sampling data available to the public upon request.

Best Management Practices (BMPs) for Industrial Facilities

In accordance with 6 NYCRR 750-1.14(f) and 40 CFR 122.44(k), the permittee is required to develop and implement a BMP plan that prevents, or minimizes the potential for, the release of toxic or hazardous pollutants to state waters. The BMP plan requires annual review by the permittee.

Stormwater Pollution Prevention Requirements

The facility discharges stormwater associated with industrial activity and stormwater discharges at this facility are required to obtain coverage under the current Multi-Sector General Permit (MSGP) Sector [C] (GP-0-23-001).

Mercury³

The facility is a new discharger located within the Great Lakes basin; therefore, the permit includes a monthly average total mercury effluent limitation of 0.7 ng/L. As the facility is required to meet the water quality standard as an effluent limitation and is not subject to the multiple discharge variance (MDV), a mercury minimization plan (MMP) is not required. [Appendix Link](#)

¹ As promulgated under 40 CFR Parts 405 - 471

² As prescribed by 6 NYCRR Part 617

³ In accordance with DOW 1.3.10 Mercury – SPDES Permitting & Multiple Discharge Variance (MDV), December 30, 2020.

Emerging Contaminant Monitoring

Emerging Contaminants, such as PFOA, PFOS, and 1,4-D, have been used in a wide variety of consumer and industrial products as well as in manufacturing processes for decades. These contaminants do not break down easily, therefore their presence in wastewater can remain a concern for years following their discontinued use. As the science surrounding these contaminants is still evolving, additional monitoring is needed to better understand potential sources and background levels. For more information on emerging contaminants, please see the NYSDEC Division of Water web page: <https://www.dec.ny.gov/chemical/127939.html>.

Pursuant to 6 NYCRR Part 750-1.13(b), the permit includes a short-term monitoring program to evaluate the influent and effluent discharge levels of Per-and Polyfluoroalkyl Substances (PFAS) and 1,4-Dioxane within the Schedule of Additional Submittals. This monitoring program is consistent with EPA PFAS guidance released in EPA guidance memos dated April 28, 2022, and December 5, 2022.

The Department will review the monitoring results and pursuant to 6 NYCRR 750-2.1(i) may notify the permittee of the need for further monitoring to identify potential sources as specified in the Emerging Contaminants Investigation Checklist for Industrial Facilities to determine whether cause exists to modify the permit to incorporate a pollutant minimization program per 6 NYCRR 750-1.14(f).

The Department will consider this information and progress made to track down and reduce or eliminate the source of the identified pollutants in determining if a permit modification is needed.

Schedule(s) of Additional Submittals

A schedule of additional submittals has been included for the following ([Appendix Link](#)) items:

- Initial and annually updated Best Management Practices (BMP) plan
- Annual Water Treatment Chemical Report
- Priority Pollutant Scan sampling requirement: to occur after the wastewater treatment plant begins operations
- Complete and certify the construction of wastewater treatment system to achieve compliance with the final effluent limitations specified in the permit

Special Conditions

Consistent with 6 NYCRR 750-2.10, the permittee is not allowed to commence construction until DEC has approved final design documents. Similarly, the permittee is not allowed to discharge until construction is complete, and DEC has accepted the construction completion certification. If any changes are made to the design during construction, the permittee must notify DEC and a determination must be made on whether the SPDES permit requires modification.

OUTFALL AND RECEIVING WATER SUMMARY TABLE

Outfall	Latitude	Longitude	Receiving Water Name	Water Class	Water Index No. / Priority Waterbody Listing (PWL) No.	Major / Sub Basin	Hardness (mg/l)	1Q10 (MGD)	7Q10 (MGD)	30Q10 (MGD)	Critical Effluent Flow	Dilution Ratio		
												A(A)	A(C)	HEW
001	44° 57' 22" N	74° 55' 04" W	Massena Power Canal	C	SL-5a PWL: 0901-0014	09 / 01	177 ⁴	-	3.9*	-	0.99 MGD	2:1	2:1	4:1
002	44° 54' 46" N	74° 54' 46" W	Groundwater	GA	-	09 / 01	-	-	-	-	750 GPD	-	-	-

*The ambient low flow condition is consistent with previous water quality reviews for discharges to the Massena Power Canal.

POLLUTANT SUMMARY TABLE - Outfall 001

Outfall #	001	Description of Wastewater: Process wastewater (cooling tower blowdown, raw water reject, and steam condensate, and compressor condensate).													
		Type of Treatment: Equalization, water treatment chemical addition, flocculation, clarification, and filtration (expected).													
Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & WQBELs						ML	Basis for Permit Requirement
			Permit Limit	Existing Effluent Quality	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. WQBEL	Basis for WQBEL		
General Notes: This is a new facility, and no discharge data is available. The "existing effluent quality" data was taken from estimates provided in the NY-2C application. All applicable water quality standards were reviewed for development of the WQBELs. The standard and WQBEL shown below represent the most stringent.															
The TBELs presented in this table represent the most conservative treatment values that are presented in TOGS 1.2.1 for facilities that include filtration. This approach was taken since, at the time of permit drafting, the conceptual treatment system included filtration.															
The water quality evaluation was performed with consideration of the downstream Grass River (Class B). WQBELs are protective of both Class B and C water classes.															
Flow Rate	MGD	Monthly Average	-	0.74	Projected	Monitor	750-1.13 Monitor	Narrative: No alterations that will impair the waters for their best usages.				6 NYCRR 703.2	-	Monitor	
	MGD	Daily Max	-	0.99	Projected	Monitor	750-1.13 Monitor								
Flow monitoring is included for informational purposes and to calculate pollutant loadings.															
pH	SU	Minimum	-	8.0	Projected	6.0	TOGS 1.2.1 (J)	7.7 ⁵	-	6.5 – 8.5	Range	No Reasonable Potential	6 NYCRR 703.3	-	TBEL
	SU	Maximum	-	9.6	Projected	9.0									
Given the available dilution, an effluent limitation equal to the TBEL is protective of the WQS.															

⁴ Ambient hardness was calculated as the average of four samples from 2020 collected at a nearby facility along the Massena Power Canal.

⁶ Ambient pH was calculated as the average of four samples from 2020 collected at a nearby facility along the Massena Power Canal.

Outfall #	001	Description of Wastewater: Process wastewater (cooling tower blowdown, raw water reject, and steam condensate, and compressor condensate).													
		Type of Treatment: Equalization, water treatment chemical addition, flocculation, clarification, and filtration (expected).													
Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & QWBELs						ML	Basis for Permit Requirement
			Permit Limit	Existing Effluent Quality	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. QWBEL	Basis for QWBEL		
Temperature	°F	Daily Max	-	87	Projected	Monitor	750-1.13 Monitor	-	Narrative (Non-Trout): The water temperature at the surface of a stream shall not be raised to more than 90F at any point and... shall not be raised or lowered to more than 5F over the temperature that existed before the addition				6 NYCRR 704.2	-	Monitor
	The discharge is expected to contribute some thermal loading to the Massena Power Canal but not in any amounts that will cause a contravention of the thermal criteria found in 6 NYCRR 704.2(b)(1). Consistent with 6 NYCRR 750-1.13(a), monitoring is required and may be used to inform future permitting decisions.														
Dissolved Oxygen (DO)	mg/L	-	-	-	-	-	-	-	-	(Non-Trout) 4.0 mg/L	Narrative	No Reasonable Potential	6 NYCRR 703.3	-	No Limitation
	The effluent is not expected to contain significant amounts of oxygen-demanding substances. Therefore, a limit for DO or BOD ₅ is not necessary to maintain the downstream water quality standard for dissolved oxygen.														
5-day Biochemical Oxygen Demand (BOD ₅)	mg/L	-	-	18	Projected	48	TOGS 1.2.1 (G)	-	See Dissolved Oxygen			-	703.3	-	No Limitation
	A limit for BOD ₅ is not necessary to maintain the downstream water quality standard for dissolved oxygen.														
Total Suspended Solids	mg/L	Daily Max	-	11	Projected	15	TOGS 1.2.1 (B)	-	Narrative: None from sewage, industrial wastes or other wastes that will cause deposition or impair the waters for their best usages.				6 NYCRR 703.2	-	TBEL
	Given that adequate dilution is available, an effluent limitation equal to the TBEL, and, consistent with TOGS 1.2.1, is protective of water quality standards.														
Nitrogen, Ammonia (as N)	mg/L	-	-	0.1	Projected	130	TOGS 1.2.1 (B)	0.019*	0.32	1.2	A(C)	No Reasonable Potential	6 NYCRR 703.5	-	No Limitation

Outfall #	001	Description of Wastewater: Process wastewater (cooling tower blowdown, raw water reject, and steam condensate, and compressor condensate).													
		Type of Treatment: Equalization, water treatment chemical addition, flocculation, clarification, and filtration (expected).													
Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & WQBELs						ML	Basis for Permit Requirement
			Permit Limit	Existing Effluent Quality	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. WQBEL	Basis for WQBEL		
June 1 st – Oct. 31 st	The WQS for Ammonia was determined from TOGS 1.1.1 from a summer pH of 7.7 (from one summer sample collected in 2020 at a nearby facility) and a temperature of 25°C (assumed value and consistent with TOGS 1.3.1E). The projected instream concentration was calculated using the projected effluent concentration of 0.1 mg/L and an ambient upstream concentration of 0.019 mg/L*. A multiplier ⁶ of 6.2 was applied to the maximum effluent concentration to account for the lack of actual effluent data. In accordance with TOGS 1.3.1E, the HEW dilution ratio was applied to calculate the projected instream concentration. A comparison of the projected instream concentration to the WQS indicates no reasonable potential to cause or contribute to a WQS violation. Therefore, no limitation is specified. *Ambient concentration calculated from the average of 31 summer samples taken from RIBS station 09-STLW-8.3 from 7/2005-10/2016.														
Nitrate-nitrite	mg/L	-	-	0.6	Projected	-	-	-	-	Narrative (nitrogen): None in amounts that will result in growths of algae, weeds and slimes that will impair the waters for their best usages.		6 NYCRR 703.2	-	No Limitation	
	There is no numeric WQS for nitrate or nitrite to class B or C waters.														
Total Organic Nitrogen (as N)	mg/L	-	-	1.2	Projected	-	-	-	-	Narrative (nitrogen): None in amounts that will result in growths of algae, weeds and slimes that will impair the waters for their best usages.		6 NYCRR 703.2	-	No Limitation	
	There is no numeric WQS for total organic nitrogen to any classification of surface or groundwater.														
Total Phosphorus (as P)	mg/L	Daily Max	-	0.024	Projected	4.6	TOGS 1.2.1 (B)	-	-	Narrative: None in amounts that will result in growths of algae, weeds and slimes that will impair the waters for their best usages.		6 NYCRR 703.2	-	No Limitation	
	mg/L	Monthly Average	-	-	-	11	TOGS 1.2.1 (B)	-	-						
	The facility is not expected to be a significant source of phosphorus. Consistent with TOGS 1.3.3, no phosphorus limitations will be imposed for facilities with a design flow less than 1.0 MGD. Given the expected effluent concentration, a TBEL is also not needed at this time.														
Total Mercury	ng/L	Daily Max	-	4.5	Projected	-	-	-	-	0.7	H(FC)	0.7	-	-	DOW 1.3.10
	See Mercury section of this fact sheet .														
Total Aluminum	mg/L	Daily Max	-	0.25	Projected	6.1	TOGS 1.2.1 (B)	-	-	100 ionic	A(C)	No Reasonable Potential	6 NYCRR 703.5	-	No Limitation

⁶ As recommended from EPA's Technical Support Document, Chapter 3.3

Outfall #	001	Description of Wastewater: Process wastewater (cooling tower blowdown, raw water reject, and steam condensate, and compressor condensate).													
		Type of Treatment: Equalization, water treatment chemical addition, flocculation, clarification, and filtration (expected).													
Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & WQBELs						ML	Basis for Permit Requirement
			Permit Limit	Existing Effluent Quality	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. WQBEL	Basis for WQBEL		
Consistent with TOGS 1.3.1E, when the pH of the receiving waterbody is 6.5 or greater, technology-based limits are adequate to meet water quality standards. However, there is no reasonable potential to exceed the water quality standard for aluminum and therefore, no TBEL or WQBEL is specified for this parameter.															
Total Arsenic	µg/L	-	-	3.0	Projected	1,400	TOGS 1.2.1 (B)	0.476	10	150	A(C)	No Reasonable Potential	6 NYCRR 703.5	-	No Limitation
	The projected instream concentration was calculated using the projected effluent concentration of 3 µg/L and an ambient upstream concentration of 0.476 µg/L, taken as the average of 24 samples from RIBS station 09-STLW-8.3 from 4/2009-10/2016. A multiplier ⁶ of 6.2 was applied to the projected effluent concentration to account for the estimation and lack of actual effluent data. A metals translator of 1.0 was applied to convert between the total and dissolved form in accordance with EPA Document 823-B-96-007. A comparison of the projected instream concentration to the WQS indicates no reasonable potential to cause or contribute to a WQS violation. Therefore, no WQBEL is specified. Given the expected effluent concentration, a TBEL is also not required at this time.														
Total Barium	µg/L	-	-	64	Projected	1,200	TOGS 1.2.1 (B)	-	-	-	-	-	-	-	No Limitation
	There is no numeric WQS for barium to class B or C waters. Given the expected effluent concentration, a TBEL is also not needed at this time.														
Total Boron	µg/L	-	-	71	Projected	1,800	TOGS 1.2.1 (B)	-	220	10,000	A(C)	No Reasonable Potential	6 NYCRR 703.5	-	No Limitation
	The projected instream concentration was calculated using the estimated effluent concentration of 71 µg/L and an assumed negligible ambient upstream concentration. A multiplier ⁶ of 6.2 was applied to the projected effluent to account for the estimation and lack of actual effluent data. A comparison of the projected instream concentration to the WQS indicates no reasonable potential to cause or contribute to a WQS violation. Therefore, no WQBEL is specified. Given the expected effluent concentration, a TBEL is also not required at this time.														
Total Fluoride	µg/L	-	-	389	Projected	35,000	TOGS 1.2.1 (B)	120	1,270	3,557	A(C)	No Reasonable Potential	6 NYCRR 703.5	-	No Limitation
	The projected instream concentration was calculated using the estimated effluent concentration of 389 µg/L and an ambient upstream concentration of 120 µg/L taken as the average of 37 samples from RIBS station 09-STLW-8.3 from 4/2001-10/2016. A multiplier ⁶ of 6.2 was applied to the projected effluent to account for the estimation and lack of actual effluent data. A comparison of the projected instream concentration to the WQS indicates no reasonable potential to cause or contribute to a WQS violation. Therefore, no WQBEL is specified. Given the expected effluent concentration, a TBEL is also not required at this time.														
Total Iron	µg/L	-	-	138	Projected	1,200	TOGS 1.2.1 (B)	-	-	-	-	-	-	-	No Limitation
	There is no numeric WQS for iron to class B or C waters. Given the expected effluent concentration, a TBEL is also not required at this time.														
Total Magnesium	mg/L	-	-	27	Projected	-	-	-	-	-	-	-	-	-	No Limitation
	There is no numeric WQS for magnesium to class B or C waters. Given the expected effluent concentration, a TBEL is also not required at this time.														
	µg/L	-	-	14	Projected	5,000	TOGS 1.2.1 (B)	-	-	-	-	-	-	-	No Limitation

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Outfall #	001	Description of Wastewater: Process wastewater (cooling tower blowdown, raw water reject, and steam condensate, and compressor condensate).														
		Type of Treatment: Equalization, water treatment chemical addition, flocculation, clarification, and filtration (expected).														
Effluent Parameter	Units	Averaging Period	Existing Discharge Data			TBELs		Water Quality Data & WQBELs						ML	Basis for Permit Requirement	
			Permit Limit	Existing Effluent Quality	# of Data Points Detects / Non-Detects	Limit	Basis	Ambient Bkgd. Conc.	Projected Instream Conc.	WQ Std. or GV	WQ Type	Calc. WQBEL	Basis for WQBEL			
Total Molybdenum		There is no numeric WQS for molybdenum to any classification of surface or groundwater. Given the expected effluent concentration, a TBEL is also not required at this time.														
Total Manganese	µg/L	-	-	10	Projected	300	TOGS 1.2.1 (B)	-	-	-	-	-	-	-	-	No Limitation
	There is no numeric WQS for manganese to class B or C waters. Given the expected effluent concentration, a TBEL is also not required at this time.															
Total Sulfate (as SO ₄)	mg/L	-	-	78	Projected	-	-	-	-	-	-	-	-	-	-	No Limitation
	There is no numeric WQS for sulfate (as SO ₄) to class B or C waters.															
Total Titanium	µg/L	-	-	9.3	Projected	530	TOGS 1.2.1 (B)	-	-	-	-	-	-	-	-	No Limitation
	There is no numeric WQS for molybdenum to any classification of surface or groundwater. Given the expected effluent concentration, a TBEL is also not required at this time.															
Total Zinc	µg/L	-	-	8.0 total	Projected	40	TOGS 1.2.1 (C)	4.9 dissolved	27 dissolved	134 dissolved	A(C)	No Reasonable Potential	6 NYCRR 703.5	-	No Limitation	
	The projected instream concentration was calculated using the estimated effluent concentration of 8 µg/L and an ambient upstream concentration of 4.9 µg/L, taken as the average of 19 dissolved zinc samples from RIBS station 09-STLW-8.3 from 5/2012-10/2016. A multiplier ⁶ of 6.2 was applied to the projected effluent concentration to account for the estimation and lack of actual effluent data. A metals translator of 1.014 was applied to convert between the total and dissolved form in accordance with EPA Document 823-B-96-007. A comparison of the projected instream concentration to the WQS indicates no reasonable potential to cause or contribute to a WQS violation. Therefore, no WQBEL is specified. Given the expected effluent concentration, a TBEL is also not required at this time.															

Appendix: Regulatory and Technical Basis of Permit Authorizations

The Appendix is meant to supplement the fact sheet for multiple types of SPDES permits. Portions of this Appendix may not be applicable to this specific permit.

Regulatory References

The provisions of the permit are based largely upon 40 CFR 122 subpart C and 6 NYCRR Part 750 and include monitoring, recording, reporting, and compliance requirements, as well as general conditions applicable to all SPDES permits. Below are the most common citations for the requirements included in SPDES permits:

- Clean Water Act (CWA) 33 section USC 1251 to 1387
- Environmental Conservation Law (ECL) Articles 17 and 70
- Federal Regulations
 - 40 CFR, Chapter I, subchapters D, N, and O
- State environmental regulations
 - 6 NYCRR Part 621
 - 6 NYCRR Part 750
 - 6 NYCRR Parts 700 - 704 – Best use and other requirements applicable to water classes
 - 6 NYCRR Parts 800 – 941 - Classification of individual surface waters
- NYSDEC water program policy, referred to as Technical and Operational Guidance Series (TOGS)
- USEPA Office of Water Technical Support Document for Water Quality-based Toxics Control, March 1991, Appendix E

The following is a quick guide to the references used within the fact sheet:

SPDES Permit Requirements	Regulatory Reference
Anti-backsliding	6 NYCRR 750-1.10(c)
Best Management Practices (BMPS) for CSOs	6 NYCRR 750-2.8(a)(2)
Environmental Benefits Permit Strategy (EBPS)	6 NYCRR 750-1.18, NYS ECL 17-0817(4), TOGS 1.2.2 (revised January 25,2012)
Exceptions for Type I SSO Outfalls (bypass)	6 NYCRR 750-2.8(b)(2), 40 CFR 122.41
Mercury Multiple Discharge Variance	Division of Water Program Policy 1.3.10 (DOW 1.3.10)
Mixing Zone and Critical Water Information	TOGS 1.3.1 & Amendments
PCB Minimization Program	40 CFR Part 132 Appendix F Procedure 8, 6 NYCRR 750-1.13(a) and 750-1.14(f), and TOGS 1.2.1
Pollutant Minimization Program (PMP)	6 NYCRR 750-1.13(a), 750-1.14(f), TOGS 1.2.1
Schedules of Compliance	6 NYCRR 750-1.14
Sewage Pollution Right to Know (SPRTK)	NYS ECL 17-0826-a, 6 NYCRR 750-2.7
State Administrative Procedure Act (SAPA)	State Administrative Procedure Act Section 401(2), 6 NYCRR 621.11(l)
State Environmental Quality Review (SEQR)	6 NYCRR Part 617
USEPA Effluent Limitation Guidelines (ELGs)	40 CFR Parts 405-471
USEPA National CSO Policy	33 USC Section 1342(q)
Whole Effluent Toxicity (WET) Testing	TOGS 1.3.2
General Provisions of a SPDES Permit Department Request for Additional Information	NYCRR 750-2.1(i)

Outfall and Receiving Water Information

Impaired Waters

The [NYS 303\(d\) List of Impaired/TMDL Waters](#) identifies waters where specific best usages are not fully supported. The state must consider the development of a Total Maximum Daily Load (TMDL) or other strategy to reduce the input of the specific pollutant(s) that restrict waterbody uses, in order to restore and protect such uses. SPDES permits must include effluent limitations necessary to implement a WLA of an EPA-approved TMDL (6 NYCRR 750-1.11(a)(5)(ii)), if applicable. In accordance with 6 NYCRR 750-1.13(a), permittees discharging to waters which are on the list but do not yet have a TMDL developed may be required to perform additional monitoring for the parameters causing the impairment. Accurate monitoring data is needed to

determine the existing capabilities of the wastewater treatment plants and to assure that wasteload allocations (WLAs) are allocated equitably.

Interstate Water Pollution Control Agencies

Some POTWs may be subject to regulations of interstate basin/compact agencies including: Interstate Sanitation Commission (ISC), International Joint Commission (IJC), Delaware River Basin Commission (DRBC), Ohio River Valley Water Sanitation Commission (ORSANCO), and the Susquehanna River Basin Commission (SRBC). Generally, basin commission requirements focus principally on water quality and not treatment technology. However, interstate/compact agency regulations for the ISC, IJC, DRBC and NYC Watershed contain explicit effluent limits which must be addressed during permit drafting. 6 NYCRR 750-2.1(d) requires SPDES permits for discharges that originate within the jurisdiction of an interstate water pollution control agency, to include any applicable effluent standards or water quality standards (WQS) promulgated by that interstate agency.

Existing Effluent Quality

The existing effluent quality is determined from a statistical evaluation of effluent data in accordance with TOGS 1.2.1 and the USEPA Office of Water, Technical Support Document for Water Quality-based Toxics Control, March 1991, Appendix E (TSD). The existing effluent quality is equal to the 95th (monthly average) and 99th (daily maximum) percentiles of the lognormal distribution of existing effluent data. When there are greater than three non-detects, a delta-lognormal distribution is assumed, and delta-lognormal calculations are used to determine the monthly average and daily maximum pollutant concentrations. Statistical calculations are not performed for parameters where there are less than ten data points. If additional data is needed, a monitoring requirement may be specified either through routine monitoring or a short-term high intensity monitoring program. The [Pollutant Summary Table](#) identifies the number of sample data points available.

Permit Requirements

Basis for Effluent Limitations

Sections 101, 301, 304, 308, 401, 402, and 405 of the CWA and Titles 5, 7, and 8 of Article 17 ECL, as well as their implementing federal and state regulations, and related guidance, provide the basis for the effluent limitations and other conditions in the permit.

When conducting a full technical review of an existing permit, the previous effluent limitations form the basis for the next permit. Existing effluent quality is evaluated against the existing effluent limitations to determine if these should be continued, revised, or deleted. Generally, existing limitations are continued unless there are changed conditions at the facility, the facility demonstrates an ability to meet more stringent limitations, and/or in response to updated regulatory requirements. Pollutant monitoring data is also reviewed to determine the presence of additional contaminants that should be included in the permit based on a reasonable potential analysis to cause or contribute to a water quality standards violation.

Anti-backsliding

Anti-backsliding requirements are specified in the CWA sections 402(o) and 303(d)(4), ECL 17-0809, and regulations at 40 CFR 122.44(*l*) and 6 NYCRR 750-1.10(c) and (d). Generally, the relaxation of effluent limitations in permits is prohibited unless one of the specified exceptions applies, which will be cited on a case-by-case basis in this fact sheet. Consistent with current case law⁷ and USEPA interpretation⁸ anti-backsliding requirements do not apply should a revision to the final effluent limitation take effect before the scheduled date of compliance for that final effluent limitation.

⁷ American Iron and Steel Institute v. Environmental Protection Agency, 115 F.3d 979, 993 n.6 (D.C. Cir. 1997)

⁸ U.S. EPA, Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; 65 Fed. Reg. 31682, 31704 (May 18, 2000); Proposed Water Quality Guidance for the Great Lakes System, 58 Fed. Reg. 20802, 20837 & 20981 (April 16, 1993)

Antidegradation Policy

New York State implements the antidegradation portion of the CWA based upon two documents: (1) Organization and Delegation Memorandum #85-40, "Water Quality Antidegradation Policy" (September 9, 1985); and, (2) TOGS 1.3.9, "Implementation of the NYSDEC Antidegradation Policy – Great Lakes Basin (Supplement to Antidegradation Policy dated September 9, 1985) (undated)." The permit for the facility contains effluent limitations which ensure that the existing best usage of the receiving waters will be maintained. To further support the antidegradation policy, SPDES applications have been reviewed in accordance with the State Environmental Quality Review Act (SEQR) as prescribed by 6 NYCRR Part 617.

Effluent Limitations

In developing a permit, the Department determines the technology-based effluent limitations (TBELs) and then evaluates the water quality expected to result from technology controls to determine if any exceedances of water quality criteria in the receiving water might result. If there is a reasonable potential for exceedances of water quality criteria to occur, water quality-based effluent limitations (WQBELs) are developed. A WQBEL is designed to ensure that the water quality standards of receiving waters are met. In general, the CWA requires that the effluent limitations for a particular pollutant are the more stringent of either the TBEL or WQBEL.

Technology-based Effluent Limitations (TBELs) for Industrial Facilities

A TBEL requires a minimum level of treatment for industrial point sources based on currently available treatment technologies and/or Best Management Practices (BMPs). CWA sections 301(b) and 402, ECL sections 17-0509, 17-0809 and 17-0811, and 6 NYCRR 750-1.11 require technology-based controls on effluents. TBELs are set based upon an evaluation of New Source Performance Standards (NSPS), Best Available Technology Economically Achievable (BAT), Best Conventional Pollutant Control Technology (BCT), Best Practicable Technology Currently Available (BPT), and/or Best Professional Judgment (BPJ).

USEPA Effluent Limitation Guidelines (ELGs) Applicable to Facility

In many cases, BPT, BCT, BAT and NSPS limitations are based on effluent guidelines developed by USEPA for specific industries, as promulgated under 40 CFR Parts 405-471. Applicable guidelines, pollutants regulated by these guidelines, and the effluent limitation derivation for facilities subject to these guidelines is in the [USEPA Effluent Limitation Guideline Calculations Table](#).

Best Professional Judgement (BPJ)

For substances that are not explicitly limited by regulations, the permit writer is authorized to use BPJ in developing TBELs. Consistent with section 402(a)(1) of the CWA, and NYS ECL section 17-0811, the Department is authorized to issue a permit containing "any further limitations necessary to ensure compliance with water quality standards adopted pursuant to state law". BPJ limitations may be set on a case-by-case basis using any reasonable method that takes into consideration the criteria set forth in 40 CFR 125.3. Applicable state regulations include 6 NYCRR 750-1.11. The BPJ limitation considers the existing technology present at the facility, the statistically calculated existing effluent quality for that parameter, and any unique or site-specific factors relating to the facility. Technology limitations generally achievable for various treatment technologies are included in TOGS 1.2.1, Attachment C. These limitations may be used for the listed parameters when the technology employed at the facility is listed.

Water Quality-Based Effluent Limitations (WQBELs)

In addition to the TBELs, permits must include additional or more stringent effluent limitations and conditions, including those necessary to protect water quality. CWA sections 101 and 301(b)(1)(C), 40 CFR 122.44(d)(1), and 6 NYCRR Parts 750-1.11 require that permits include limitations for all pollutants or parameters which are or may be discharged at a level which may cause or contribute to an exceedance of any State water quality standard adopted pursuant to NYS ECL 17-0301. Water quality standards can be found under 6 NYCRR Parts 700-704. The limitations must be stringent enough to ensure that water quality standards are met and must be consistent with any applicable WLA which may be in effect through a TMDL for the receiving water. These and other requirements are summarized in TOGS 1.1.1, 1.3.1,

1.3.2, 1.3.5 and 1.3.6. The Department considers a mixing zone analysis, critical flows, and reasonable potential analysis when developing a WQBEL.

Mixing Zone Analyses

In accordance with TOGS 1.3.1., the Department may perform additional analysis of the mixing condition between the effluent and the receiving waterbody. Mixing zone analyses using plume dispersion modeling are conducted in accordance with the following:

“EPA Technical Support Document for Water Quality-Based Toxics Control” (March 1991); EPA Region VIII’s “Mixing Zones and Dilution Policy” (December 1994); NYSDEC TOGS 1.3.1, “Total Maximum Daily Loads and Water Quality-Based Effluent Limitations” (July 1996); “CORMIX v11.0” (2019).

Critical Flows

In accordance with TOGS 1.2.1 and 1.3.1, WQBELs are developed using dilution ratios that relate the critical low flow condition of the receiving waterbody to the critical effluent flow. The critical low flow condition used in the dilution ratio will be different depending on whether the limitations are for aquatic or human health protection. For chronic aquatic protection, the critical low flow condition of the waterbody is typically represented by the 7Q10 flow and is calculated as the lowest average flow over a 7-day consecutive period within 10 years. For acute aquatic protection, the critical low flow condition is typically represented by the 1Q10 and is calculated as the lowest 1-day flow within 10 years. However, NYSDEC considers using 50% of the 7Q10 to be equivalent to the 1Q10 flow. For the protection of human health, the critical low flow condition is typically represented by the 30Q10 flow and is calculated as the lowest average flow over a 30-day consecutive period within 10 years. However, NYSDEC considers using 1.2 x 7Q10 to be equivalent to the 30Q10. The 7Q10 or 30Q10 flow is used with the critical effluent flow to calculate the dilution ratio. The critical effluent flow can be the maximum daily flow reported on the permit application, the maximum of the monthly average flows from discharge monitoring reports for the past three years, or the facility design flow. When more than one applicable standard exists for aquatic or human health protection for a specific pollutant, a reasonable potential analysis is conducted for each applicable standard and corresponding critical flow to ensure effluent limitations are sufficiently stringent to ensure all applicable water quality standards are met as required by 40 CFR 122.44(d)(1)(i). For brevity, the pollutant summary table reports the results of the most conservative scenario.

Reasonable Potential Analysis (RPA)

The Reasonable Potential Analysis (RPA) is a statistical estimation process, outlined in the 1991 USEPA Technical Support Document for Water Quality-based Toxics Control (TSD), Appendix E. This process uses existing effluent quality data and statistical variation methodology to project the maximum amounts of pollutants that could be discharged by the facility. This projected instream concentration (PIC) is calculated using the appropriate ratio and compared to the water quality standard (WQS). When the RPA process determines the WQS may be exceeded, a WQBEL is required. The procedure for developing WQBELs includes the following steps:

- 1) identify the pollutants present in the discharge(s) based upon existing data, sampling data collected by the permittee as part of the permit application or a short-term high intensity monitoring program, or data gathered by the Department;
- 2) identify water quality criteria applicable to these pollutants;
- 3) determine if WQBELs are necessary (i.e. reasonable potential analysis (RPA)). The RPA will utilize the procedure outlined in Chapter 3.3.2 of EPA’s Technical Support Document (TSD). As outlined in the TSD, for parameters with limited effluent data the RPA may include multipliers to account for effluent variability; and,
- 4) calculate WQBELs (if necessary). Factors considered in calculating WQBELs include available dilution of effluent in the receiving water, receiving water chemistry, and other pollutant sources.

The Department uses modeling tools to estimate the expected concentrations of the pollutant in the receiving water and develop WQBELs. These tools were developed in part using the methodology referenced above. If the estimated concentration of the pollutant in the receiving water is expected to exceed the ambient water quality standard or guidance value (i.e. numeric interpretation of a narrative water quality standard), then there is a reasonable potential that the discharge may cause or contribute to an exceedance of any State water quality standard adopted pursuant to NYS ECL 17-0301. If a TMDL is in place, the facility's WLA for that pollutant is applied as the WQBEL.

For carbonaceous and nitrogenous oxygen demanding pollutants, the Department uses a model which incorporates the Streeter-Phelps equation. The equation relates the decomposition of inorganic and organic materials along with oxygen reaeration rates to compute the downstream dissolved oxygen concentration for comparison to water quality standards.

A Watershed Maximum Daily Load (WMDL) may be developed by the Department to account for the cumulative effect of multiple discharges of conservative toxic pollutants to ensure water quality standards are met in downstream segments. The WMDL uses a simple dilution model, assuming full mix in the receiving stream, to calculate the maximum allowable pollutant load that can be discharged and still meet water quality standards during critical low flow in downstream segments such as those with sensitive receptors (e.g. public water supply) or higher water classification. WQBELs are established to ensure that the cumulative mass load from point source discharges does not exceed the maximum allowable load to ensure permit limits are protective of water quality.

Monitoring Requirements

CWA section 308, 40 CFR 122.44(i), 6 NYCRR 750-1.13, and 750-2.5 require that monitoring be included in permits to determine compliance with effluent limitations. Additional effluent monitoring may also be required to gather data to determine if effluent limitations may be required. The permittee is responsible for conducting the monitoring and reporting results on Discharge Monitoring Reports (DMRs). The permit contains the monitoring requirements for the facility. Monitoring frequency is based on the minimum sampling necessary to adequately monitor the facility's performance and characterize the nature of the discharge of the monitored flow or pollutant. Variable effluent flows and pollutant levels may be required to be monitored at more frequent intervals than relatively constant effluent flow and pollutant levels (6 NYCRR 750-1.13). For industrial facilities, sampling frequency is based on guidance provided in TOGS 1.2.1. For municipal facilities, sampling frequency is based on guidance provided in TOGS 1.3.3.

Other Conditions

Mercury

The multiple discharge variance (MDV) for mercury was developed in accordance with 6 NYCRR 702.17(h) "to address widespread standard or guidance value attainment issues including the presence of a ubiquitous pollutant or naturally high levels of a pollutant in a watershed." The first MDV was issued in October 2010, and subsequently revised and reissued in 2015; each subsequent iteration of the MDV is designed to build off the previous version, to make reasonable progress towards the water quality standard (WQS) of 0.7 ng/L dissolved mercury. The MDV is necessary because human-caused conditions or sources of mercury prevent attainment of the WQS and cannot be remedied (i.e., mercury is ubiquitous in New York waters at levels above the WQS and compliance with a water quality based effluent limitation (WQBEL) for mercury cannot be achieved with demonstrated effluent treatment technologies). The Department has determined that the MDV is consistent with the protection of public health, safety, and welfare. During the effective period of this MDV, any increased risks to human health are mitigated by fish consumption advisories issued periodically by the NYSDOH.

All surface water SPDES permittees are eligible for authorization by the MDV provided they meet the requirements specified in DOW 1.3.10.

Permittee: Air Products & Chemicals, Inc.
Facility: Massena Green Hydrogen Facility
SPDES Number: NY0270342
USEPA Non-Major/Class 01 Industrial

Date: October 30, 2023 v.1.18
Permit Writer: Peter Maier
Water Quality Reviewer: Evan Walters
Full Technical Review

Schedules of Compliance

Schedules of compliance are included in accordance with 40 CFR Part 132 Attachment F, Procedure 9, 40 CFR 122.47 and 6 NYCRR 750-1.14. Schedules of compliance are intended to, in the shortest reasonable time, achieve compliance with applicable effluent standards and limitations, water quality standards, and other applicable requirements. Where the time for compliance is more than nine months, the schedule of compliance must include interim requirements and dates for their achievement. If the time necessary to complete the interim milestones is more than nine months, and not readily divisible into stages for completion, progress reports must be required.

Schedule(s) of Additional Submittals

Schedules of Additional Submittals are used to summarize the deliverables required by the permit not identified in a separate Schedule of Compliance.

Best Management Practices (BMP) for Industrial Facilities

BMP plans are authorized for inclusion in NPDES permits pursuant to Sections 304(e) and 402 (a)(1) of the Clean Water Act, and 6 NYCRR 750-1.14(f). The regulations pertaining to BMPs are promulgated under 40 CFR Part 125, Subpart K. These regulations specifically address surface water discharges.